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Electrochemical properties of crown-containing N-(thio)phosphoryl(thio)ureas and their complexes with 3d transition metals

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Abstract

The electrochemical behavior of crown-containing N-(thio)phosphoryl(thio)ureas and their complexes with 3d transition metals was studied by dc voltammetry on a graphite electrode in acetone. Crown-containing N-(thio)phosphoryl(thio)ureas are not reduced but are oxidized on solid electrodes in the examined range of potentials; the electrons are transferred via the (thio)urea group. Electrooxidation of macrocyclic Co(II), Ni(II), and Cu(II) complexes probably occurs via formation of M(III) complex species. Electroreduction of these metal complexes involves stepwise electron transfer, with the oxidation state of the metal atom decreasing to 0, followed by dissociation of the electrochemical reaction products.

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